MAS223, Feedback on Assignment 1

Q8: discrete random variables

- In part (a), several people who showed that $F(x) = 1 - \frac{1}{x+1}$, for $x \in \mathbb{N}$, also claimed that $F(x) = 0$ otherwise. This forgets the case when $x > 0$ and $x \notin \mathbb{N}$ - in this case $F(x) = F(n)$ where n is given by $n \leq x < n + 1$.
- In part (b), it's important to remember that $\mathbb{P}[X \geq x] = 1 - \mathbb{P}[X < x]$, which is not $= 1 - \mathbb{P}[X \leq x]$, in general. This mistake results in getting $x = 99$ instead of the correct answer $x = 100$.

Q9: continuous random variables

- I accepted non-rigorous arguments for limits (this is not an analysis course!) but it is still important to avoid writing equations that don't make sense, such as $\frac{\infty}{\infty} = 1$.
- A small number of people tried checking special cases to show that F is increasing (e.g. that $f(1) < f(2)$), but this doesn't answer the question. One good strategy is to show that $F'(x) \geq 0$, another way is to assume $x < y$ and simplify $F(x) \leq F(y)$ down to something true.

Q11: continuous random variables

- Some people forgot the limits of integration in the formula $F_X(x) = \int_{-\infty}^{x} f_X(u)du$, and got the wrong answer as a result.

Q15: the Gamma distribution

- This question was very well done, in general. Some people forgot to calculate skewness.